THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

In re Application of	
Inventor: Stephen Bernard Pollard	: Confirmation No. 9130
	:
U.S. Patent Application No. 10/805,218	: Group Art Unit: 2622
	:
Filed: March 22, 2004	: Examiner: JOHN H. MOREHEAD
For: COMBINED OPTICAL AND DIGITAL ZOOM	

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Attn: BOARD OF PATENT APPEALS AND INTERFERENCES

BRIEF ON APPEAL

Further to the Notice of Appeal filed April 28, 2008, in connection with the above-identified application on appeal, herewith is Appellant's Brief on Appeal. The Commissioner is authorized to charge Deposit Account No. 08-2025 in the amount of $510 for the statutory fee.

To the extent necessary, Appellant hereby requests any required extension of time under 37 C.F.R. §1.136 and hereby authorizes the Commissioner to charge any required fees not otherwise provided for to Deposit Account No. 08-2025.

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I. Real Party in Interest

The real party in interest is Hewlett-Packard Development Company, L.P., a Texas limited partnership.

II. Related Appeals and Interferences

There are no related appeals and/or interferences.

III. Status of Claims

1. There are 29 claims in the application, identified as claims 1-29.
2. Claims canceled: 1, 8, 12-22 and 27-29
3. Claims withdrawn from consideration but not canceled: None
4. Claims pending: 2-7, 9-11, and 23-26.
5. Claims allowed: None
6. Claims rejected: 2-7, 9-11, and 23-29
7. Claims on appeal: 2-7, 9-11, and 23-26

IV. Status of Amendments

All previously submitted amendments have been entered. The only amendment after the final rejection is submitted herewith. Because this amendment cancels claims 27-29, appellant will proceed on the presumption the amendment will be entered.

V. Summary of Claimed Subject Matter

Independent claim 9 is directed to a zoom apparatus for digital image processing (title, page 1, lines 2 and 3). An optical zoom lens 20 (Fig. 5; paragraph 33, page 10, line 2) provides an image across a continuous zoom range, e.g., 1x to 3x (paragraph 0034, page 10, lines 2-50). Image sensor 26 (Fig. 5, page 10, line 5) receives an image from optical zoom lens 20 and provides a digital representation of the image. Digital zoom apparatus in the form of controller 28 (page 10, lines 2-9) applies (a) one of at least two discrete zoom levels (e.g., 1x or 2x, "digital zoom graph of Fig. 6; page 11, line 4; page 12, lines 3, 4) to the digital representation of the image such that the total apparent zoom level is the product of the discrete digital zoom level and the optical zoom level (paragraph 33, first sentence), and (b) digital interpolation 37 to the digital representation of the image (page 10, paragraph 34, lines 2-4; page 12, last two sentences) during transition period 40 (page 11, paragraph 0036, first sentence; page 4, paragraph 0007, lines 1-4) between the discrete zoom levels (page 4, paragraph 0007, lines 1-3). The transition period between discrete zoom levels is initiated only at the end points (e.g., 1x and 3x) of the optical lens zoom range (page 5, paragraph 0011, lines 1-3; page 16, lines 1-3).

Independent claim 10 is also directed to a zoom apparatus for digital image processing (title, page 1, lines 2 and 3). An optical zoom lens 20 (Fig. 5; paragraph 33, page 10, line 2) provides an image across a continuous zoom range, e.g., 1x to 3x (paragraph 0034, page 10, lines 2-50). Image sensor 26 (Fig. 5, page 10, line 5) receives an image from optical zoom lens 20 and provides a digital representation of

the image. Digital zoom apparatus in the form of controller 28 (page 10, lines 2-9) applies (a) one of at least two discrete zoom levels (e.g., 1x or 2x, "digital zoom graph of Fig. 6; page 11, line 4; page 12, lines 3, 4) to the digital representation of the image such that the total apparent zoom level is the product of the discrete digital zoom level and the optical zoom level (paragraph 33, first sentence), and (b) digital interpolation 37 to the digital representation of the image (page 10, paragraph 34, lines 2-4; page 12, last two sentences) during transition period 40 (page 11, paragraph 0036, first sentence; page 4, paragraph 0007, lines 1-4) between the discrete zoom levels (page 4, paragraph 0007, lines 1-3). The digital zoom apparatus applies the digital interpolation 37 (Fig. 6) such that the rate of change of total apparent zoom level indicated by the slope of dotted line 38 during and after transition period 40 is substantially equal to the rate of change of zoom level provided by optical zoom lens 20, as indicated by the slope of the solid line labeled "Optical Zoom" (Fig. 6) prior to period 40 (sentence bridging pages 10 and 11; page 18, paragraph 0034, lines 2-4).

VI. Grounds of Rejection to be Reviewed on Appeal

The rejection of claims 2-7, 9-11 and 23-26 as being anticipated by Koseki et al., US Patent 6,947,074

VII. Argument

A. Koseki et al. does not anticipate the requirement of independent claim 9 for the transition period between discrete zoom levels to be initiated only at the end points of the optical zoom lens range.

Page 4 of the final rejection, in connection with the dependent claim 5, alleges Koseki et al., in Figs. 19 and 20, and column 16, lines 25-67, and column 17, lines 1-26, discloses a transition period between discrete zoom levels that is arranged to be initiated only at the end points of optical zoom lens range. (This portion of the rejection is relied on in connection with a similar statement in the rejection of claim 9.) An inspection of the relied upon portion of Koseki et al. indicates the Examiner's position is erroneous. Column 16, lines 36-38, and Fig. 19 indicate the maximum zoom magnification by the optical zoom is 3.2. Page 8 of the final rejection states the ends of image magnification are "1x and its maximum 3.2x. Hence, to satisfy the foregoing requirement of claim 9, it is necessary for transitions between discrete zoom levels to be only at optical magnifications of 1x or 3.2x. Column 16, lines 47-54, and Fig. 19 of Koseki et al. indicate the optical zoom returns to a zoom magnification of 1 after reaching a zoom magnification of 2, at time t1. Since the maximum zoom magnification of Koseki et al. is 3.2, Koseki et al. does not disclose the foregoing requirement of claim 9.

Item 3, page 2, of the final rejection discusses this limitation but fails to explain how the electronic zoom of 2x, at point of change 2, is at the end point of the optical lens. Item 3, page 2, of the final rejection includes a comment about the limitation

perhaps not being anticipated by Koseki et al. Such a comment is irrelevant to a rejection based on 35 USC 102(e). Further, there is nothing in the art of record to substantiate the Examiner's statement that it is well known in the art that electronic, or digital zooming, occurs after optical zooming, or when the optical zooming lens is at the end of its driving range. In addition, this comment ignores the claim 9 requirement for the transition period to be initiated only at the end points of the optical lens zoom range. Based on the foregoing, the anticipation rejection of claim 9 is wrong and must be reversed.

B. Koseki et al. fails to anticipate the requirement of independent claim 10 for the digital interpolation to be such that the rate of change of total apparent zoom level is substantially equal to the rate of change of zoom level provided by the optical zoom lens.

To meet the requirement of claim 10 for the rate of change of total apparent zoom level to be substantially equal to the rate of change of zoom level provided by the optical zoom lens, the final rejection relies on Figs. 21 and 22 and column 18, lines 43-67 and column 19, lines 1-20, of Koseki et al., in connection with the rejection of claim 6, which is referenced in the rejection of claim 10 on page 6 of the final rejection. An inspection of Fig. 22 of Koseki et al. indicates that the total, that is, overall, zoom magnification of the optical zoom and the electronic zoom is represented by the line designated as $f2_T$; see column 18, lines 49-51 of Koseki et al. The optical zoom magnification is represented by the line $f2_O$; column 18, lines 45-47. The electronic zoom magnification is represented by the line $f2_E$ in Fig. 22, as indicated by column

18, lines 47 and 48. The rate of change of the optical zoom magnification is the slope of line $f2_O$, of Fig. 22. The rate of change of the overall zoom magnification, that is, the magnification of the optical and electronic zooms combined, is represented by the slope of the line $f2_T$.

It is apparent from an inspection of Fig. 22 that the slope of line $f2_T$ is much greater than the slope of $f2_O$. The optical zoom increases from a level of 1.0 to 2.0 between times t_0 and t_6, as indicated by Fig. 22 and discussed in column 19, lines 41-44. During the same interval, the combined zoom magnification, represented by $f2_T$, increases from 1.0 to 6.0, as indicated by Fig. 22 and discussed in column 19, lines 43 and 44. Hence, there is an enormous difference between the rate of change of the optical zoom magnification and the total zoom magnification during the interval from time t_0 to time t_6. In particular, during this interval, the slope, that is, rate of change, of the optical zoom is one unit, but the increase of the total zoom magnification is six units. During the period from t_6 to t_E, there is an increase in the optical zoom of two units from 2.0 to 4.0. In contrast, during the interval from t_6 to t_E, there is an increase in the total zoom magnification of 6 units. Consequently, the total apparent zoom level of the apparatus described in connection with Fig. 22 of Koseki et al. is not substantially equal to the rate of change of zoom level provided by the optimum zoom lens.

The discussion on page 3, item 5, of the final rejection in the portion of the final rejection entitled "Response to Arguments" is irrelevant. The fact that the rate of change of optical zoom lens increases and the overall zoom magnification increases

and that the optical zoom lens magnification is perhaps proportional to the overall zoom magnification has nothing to do with the requirement of claim 10 for the rate of change of total apparent zoom level to be substantially equal to the rate of change of zoom level provided by the optical zoom lens.

The discussion in item 5, page 3, of the final rejection concerning the terminology "substantially equal" is wrong. An inspection of Fig. 22 of Koseki et al. indicates the slope of line $f2_T$ is much different from the slope of line $F2_O$.

C. Koseki et al. does not anticipate the requirement of dependent claim 5 for the transition period between discrete zoom levels to be initiated only at the end points of the optical zoom lens range.

The limitation of claim 5, which ultimately depends on claim 10, was discussed *supra*, in connection with the rejection of claim 9. Hence, claim 5 is allowable for the same reasons advanced for claim 9, as well as for the reasons advanced for claim 10.

D. Koseki et al. does not anticipate the requirement of claim 6 for the digital zoom apparatus to apply the digital interpolation such that the rate of change of total apparent zoom level is substantially equal to the rate of change of the zoom level provided by the optical zoom lens.

Claim 6 depends on claim 9 and includes the limitations of claim 10. For the reasons advanced in connection with the rejection of claim 10, the rejection of claim 6 is incorrect. In addition, the rejection of claim 6 is wrong because claim 6 depends on claim 9.

Reversal of the rejection is in order.

Respectfully submitted,

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VIII. Claims Appendix

2. Zoom apparatus according to claim 9, wherein during the transition period between discrete zoom levels the optical zoom lens is arranged to be adjusted to substantially compensate for the change in discrete digital zoom level.

3. Zoom apparatus according to claim 2, wherein the optical zoom lens is arranged to be automatically adjusted to a point in the optical zoom lens zoom range that provides, as a product of zoom level with the changed digital zoom level, a total apparent zoom level substantially equal to the zoom level provided by the digital interpolation.

4. Zoom apparatus according to claim 10, wherein the zoom lens is arranged to be automatically adjusted from a first end of the zoom range of the zoom lens towards a second end of the zoom range during the transition period between discrete zoom levels.

5. Zoom apparatus according to claim 4, wherein the transition period between discrete zoom levels is arranged to be initiated only at the end points of the optical zoom lens zoom range.

6. Zoom apparatus according to claim 9, wherein the digital zoom apparatus is arranged to apply the digital interpolation such that the rate of change of total apparent zoom level is substantially equal to the rate of change of zoom level provided by the optical zoom lens.

7. Zoom apparatus according to claim 9, wherein the discrete digital zoom levels are arranged to be provided by applying discrete charge binning schemes.

9. Zoom apparatus for digital image processing comprising:

an optical zoom lens arranged to provide an image across a continuous zoom range;

an image sensor arranged to receive an image from the optical zoom lens and to provide a digital representation of the image; and

digital zoom apparatus arranged to apply (a) one of at least two discrete zoom levels to the digital representation of the image such that the total apparent zoom level is the product of the discrete digital zoom level and the optical zoom level, and (b) digital interpolation to the digital representation of the image during a transition period between discrete zoom levels, the transition period between discrete zoom levels being arranged to be initiated only at the end points of the optical zoom lens zoom range.

10. Zoom apparatus for digital image processing comprising:

an optical zoom lens arranged to provide an image across a continuous zoom range;

an image sensor arranged to receive an image from the optical zoom lens and to provide a digital representation of the image; and

digital zoom apparatus arranged to apply (a) one of at least two discrete zoom levels to the digital representation of the image such that the total apparent zoom level is the product of the discrete digital zoom level and the optical zoom level, and (b) digital interpolation to the digital representation of the image during a transition period between discrete zoom levels, the digital zoom apparatus being arranged to apply the digital interpolation such that the rate of change of total apparent zoom level is substantially equal to the rate of change of zoom level provided by the optical zoom lens.

11. Zoom apparatus according to claim 10, wherein the discrete digital zoom levels are arranged to be provided by applying discrete charge binning schemes.

23. A digital camera in combination with the zoom apparatus according to claim 9.

24. A digital camera in combination with the zoom apparatus according to claim 10.

25. Zoom apparatus according to claim 10, wherein during the transition period between discrete zoom levels the optical zoom lens is arranged to be adjusted to substantially compensate for the change in discrete digital zoom level.

26. Zoom apparatus according to claim 25, wherein the optical zoom lens is arranged to be automatically adjusted to a point in the optical zoom lens zoom range that provides, as a product of zoom level with the changed digital zoom level, a total apparent zoom level substantially equal to the zoom level provided by the digital interpolation.

IX. Evidence Appendix

None.

X. Related Proceedings Appendix

None.